**36.** Since every packet is routed different in an IP datagram, the option must exist in each packet.

**40.** To allow for growth, round each request up to the nearest power of two, so:

A: 4096 198.16.0.0 –198.16.15.255; 198.16.0.0/20

B: 2048; 198.16.16.0 – 198.23.15.255; 198.16.16.0/21

C: 4096; 198.16.32.0 – 198.47.15.255; 198.16.32.0/20

D: 8192; 198.16.64.0 – 198.95.15.255; 198.16.64.0/19

**41.** They can be aggregated to 57.6.96/19, since it provides enough address space.

**42.** By rule the longest address space wins, so it is enough to just add 29.18.0.0/22 for the new block

**44.** Yes, as long as traffic can be routed appropriately in regards to connection using IBGP internally.

**Problem 6)** Convert the address of regal.csesp.umflint.edu to hexadecimal.

IP : 141.216.26.5 : To binary: 10001101.11011000.00011010.00000101, And thus, to hex: 8D.D8.1A.05

**Problem 7)** A class B network on the Internet has a subnet mask of 255.255.248.0. What is the number of subnets, and the approximate number of hosts per subnet?

8192 subnets, with 32764 hosts

**Problem 8)** A router has the following CIDR entries in its routing table:

**135.46.56.0/22 Router 2**

**135.46.50.0/21 Router 3**

**192.46.16.0/23 interface 0**

**192.46.20.0/22 interface 1**

**192.46.24.0/21 interface 2**

**default router 1**

**a)** In the 192 range, are there any available blocks within the ranges shown? If so, what?

135.46.50.0/21 extends through 135.46.57.255

135.46.56.0/21 extends through 135.46.59.255 – no gaps in this range, in fact, they overlap

192.46.16.0/23 extends through 192.46.17.255 – gap from 192.46.18.0 to 192.46.19.255

192.46.20.0/22 extends through 192.46.23.255

194.46.24.0/21 extends to [doesn’t matter for part a, but] 194.46.31.255

Where will the following addresses be routed?

**b)** 192.46.19.24 – this request will go to router 1 has it has no manual route

**c)** 135.46.57.42 – router 3

**d)** 192.46.32.24 – router 1

**e)** 192.46.18.47 – router 1